REMARKS

Claims 1-48 are pending in the application. Claims 1, 35, 42, and 45-48 are independent claims. All claims have been rejected under 35 U.S.C. 103(a). Those rejections are respectfully traversed and reconsideration is requested.

Rejection of Claims 1-48 under 35 U.S.C. 103(a)

Claims 1-2, 6, 16, 29-32, 35-36, and 39-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yourlo (U.S. Patent No. 6,201,176) in view of Sanderson (U.S. Patent No. 6,545,485).

Claims 3-5, 7-13, and 17-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yourlo in view of Sanderson, as applied to claims 1-2, 6, 16, 29-32, 35-36, and 39-48 above, and further in view of Hoory et al. (U.S. Patent No. 6,678,655).

Claims 14-15 and 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yourlo in view of Sanderson, and further in view of Hoory as applied to claims 3-5, 7-13, and 17-28 above, and further in view of Walker et al. (U.S. Patent No. 6,710,822).

Claims 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yourlo in view of Sanderson, as applied to claims 1-2, 6, 16, 29-32, 35-36, and 39-48 above, and further in view of Bloom et al. (U.S. Patent No. 4,591,928).

To establish a prima facie case for obviousness under 35 U.S.C. 103(a), (1) there must be some suggestion or motivation to combine reference teachings. (2) There must be a reasonable expectation of success. (3) The references when combined must teach or suggest all the claim limitations. For the reasons discussed below, it is respectfully submitted that the Office has not established a prima facie case under 35 U.S.C. 103(a) for Claims 1-48, and that therefore, Claims 1-48 are in condition for allowance.

Before discussing the cited references however, a brief review of the Applicants' disclosure may be helpful. The Applicants' disclosed invention is directed to a method and system for determining similarity between a plurality of musical works. For each musical work, forming (i) a spectral signature based on spectral features and (ii) a rhythmic beat representation for each musical work. For a given musical work of interest: (a) comparing its spectral

representation to the spectral representations of the musical works in the plurality; (b) comparing its rhythmic beat representation to the rhythmic beat representations of the musical works in the plurality; and (c) summing, including respective weighting of results of the comparisons in (a) and (b), the summed results providing an indication of which musical works in the plurality are similar to the given musical work of interest.

Turning to the cited prior art, Yourlo discusses a method for identifying and retrieving particular pieces of music or attributes of a desired piece of music from a music database on the basis of a query composed of desired features and conditional statements. Pieces of music are classified based on extracted features (properties) of the piece of music and stored in a database for future retrieval. The result of a query outputs the piece of music and/or the music identifiers associated with the desired piece of music.

Cited prior art, Sanderson discusses a method for locating radio frequency interference sources on power distribution and transmission systems. The ultrasonic frequencies emitted from the interference source are converted to electrical voltages. While processing the electric voltages, a "spectral signature" is created. This spectral signature is a spectrum that includes values proportional to the ultrasonic shock waves modulated in each of a set of consecutive frequency ranges. (*See* col. 1 lines 40-49, col. 1 line 66 to col. 2 line 2, and col. 6 lines 24-30). ..

Cited prior art, Hoory discusses a digitized speech signal encoder for compressing a digitized speech signal. (*See* Abstract).

Cited prior art, Walker discusses an image processing apparatus for measuring similarities between different video data (including image and voice data).

Cited prior art, Bloom is directed to a post-synchronizing technique, that is, replacing dialog in a movie soundtrack that is recorded live at the time of shooting the movie with dialog recorded later in a studio.

Sanderson, discusses a ***spectral signature*** that is simply the spectrum of frequencies of the targeted ultrasonic sound. (*See* col. 6 lines 24-30). The Applicants' disclosed ***spectral representation*** is the spectrum of frequencies of the selected music sound, and the ***spectral signature*** is the result of further processing of the spectral representation, for example, in one embodiment, the clustering of spectral representations. (*See* Applicants' Specification, page 9 line 4 to page 11 line 13, and Fig. 3).

Therefore, Yourlo and Sanderson, considered either separately or in combination, do not teach or suggest the Applicants' claimed "forming (i) a spectral signature based on spectral features from the corresponding audio file" as recited in independent Claim 1.

Yourlo's mere discussion of a method for extracting the tempo from an audio representation does not teach or suggest extraction of the rhythmic beat. The ***rhythmic beat*** and the ***tempo*** of a musical piece are not the same. As is well known to those skilled in the art, the rhythmic beat refers to the relative strength of particular beats, while the tempo refers to the speed at which the music is played. Using the rhythmic beat to compare musical pieces allows songs with similar rhythms, but at different tempos, to be compared to determine similarity. (*See* Applicants' Specification, page 12 lines 7-11).

Therefore, Yourlo's mere discussion of extraction of the tempo from the audio representation does not teach or suggest "forming (ii) a rhythmic beat representation from the corresponding audio file" as claimed by the Applicants.

In addition, Yourlo does not teach or suggest the Applicants' claimed "summing, including respective weighting of results of the comparisons in (a) and (b), said summed results providing an indication of which musical works in the plurality are similar to the given musical work of interest" as recited in independent Claim 1.

In the Applicants' disclosed invention, the summing is performed ***after*** the respective comparisons between the (a) spectral signatures and (b) rhythmic beat representations of the audio representations. The steps for summing the results are as follows: (1) determine the distance between the spectral signatures, (2) determine the distance between the rhythmic beat representations, and (3) determine the combined similarity measure by weighting and summing the two results. (*See* Applicants' Specification, page 14 lines 1-8, and Fig. 2).

In contrast, Yourlo sums the coefficients of each window of a Fast Fourier Transform during the extraction process of a single feature, and merely discusses using the extracted features of the audio to provide an indication of similarity. (*See* col. 5 lines 58-65, col. 12 line 44 to col. 13 line 37, Fig. 5, and Figs. 18-21). Yourlo does not sum the ***results*** of the respective feature comparisons of the audio representations.

Therefore, the combination of Yourlo and Sanderson, does not teach or suggest the Applicants' disclosed method for determining similarity between a plurality of musical works.

Independent Claims 35 and 42 recite a like distinction in terms of a method, and independent Claims 45-48 recites a like distinction in terms of an apparatus, and thus similarly patentably distinguish over the prior art.

Claims 2-34 depend from independent Claim 1, Claims 36-41 depend from independent Claim 35, and Claims 43-44 depend from independent Claim 42. Accordingly, these claims should be found in allowable condition for the same reasons as Claim 1 above, as well as on the basis of additional limitations in these claims.

For example, Yourlo's discussion of segmenting a piece of music into a plurality of windows does not teach or suggest "performing a windowing function on each frame" as claimed by the Applicants in dependent Claim 6. The Applicants disclosed "windowing function" is performed on each frame that results from dividing the audio file. (*See* Applicants' Specification, page 10 lines 3-6).

Yourlo's discussion of a distance metric does not teach or suggest "computing a similarity matrix for the audio file" as claimed by the Applicants in dependent Claim 19. In contrast, Yourlo discusses computing a distance metric between two different pieces of music. (*See* col. 4 lines 6-7, col. 12 lines 11-16).

Yourlo's discussion of a similarity comparison process that searches a database for matches for a music query does not teach or suggest the Applicants' claimed "generating a set of similar musical works" as claimed by the Applicants in dependent Claim 29. In contrast to Yourlo's processes that search for matches, the Applicants' system generates a set of similar musical works for the given musical work of interest. (*See* Applicants' Specification, page 14 lines 9-26).

Yourlo's discussion of graphs illustrating features for different music does not teach or suggest "visually displaying on a display device, the musical works in a manner illustrating relative similarities or dissimilarities of the musical works" as claimed by the Applicants in dependent Claim 30. In contrast to the extracted features of music displayed by Yourlo, the Applicants illustrate similarities of the musical works. (*See* Applicants' Specification, page 18 lines 17-22, and Fig. 6). Yourlo merely discusses selecting music based on results of the comparison of extracted features. (*See* col. 12 lines 44-50). There is no discussion of how the results of the comparison would be visually displayed on a display device.

Yourlo's discussion of manual categorization of music based subjective content of songs does not teach or suggest "constructing a matrix of song similarity based on the relative distance" as claimed by the Applicants in dependent Claim 32.

Furthermore, Yourlo is directed to a system for querying a music database, Sanderson is directed to a system for locating radio frequency interference sources on power distribution and transmission systems, Hoory is directed to a system for compressing a digitized speech signal, Walker is directed to image processing and Bloom is directed to a post-synchronizing technique. One skilled in the art of music databases would not look to a radio frequency interference location, a compression of digitized speech signals, an image processing, or a post-synchronizing technique to determine the similarity between a plurality of musical works as claimed. Thus, there is no suggestion to combine Yourlo with Sanderson, Hoory, Walker, or Bloom. Even if combined, Yourlo, Sanderson, Hoory, Walker, and Bloom do not teach or suggest the Applicants' claimed invention. Thus, none of the cited prior art alone or in combination makes obvious the Applicants' claimed method for determining similarity between a plurality of musical works.

As such, the 35 U.S.C. 103(a) rejections of Claims 1-48 are believed to be overcome. Accordingly, the present invention as claimed is not believed to be made obvious from the cited art or any of the prior art. Removal of the rejections under 35 U.S.C. 103(a) and acceptance of Claims 1-48 is respectfully requested.

CONCLUSION

In view of the above remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By Mary Lou Wakimura

Mary Lou Wakimura
Registration No. 31,804
Telephone: (978) 341-0036
Facsimile: (978) 341-0136

Concord, MA 01742-9133
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